

# **Spot Safety Project Evaluation**

Project Log # 200512215

Spot Safety Project # 09-01-209

## **Spot Safety Project Evaluation of the Installation of Left Turn Lanes on NC 152 at Its Intersection with SR 1541/ SR 1419 (Stirewalt Rd) Rowan County**

Documents Prepared By:

Safety Evaluation Group  
Traffic Safety Systems Management Section  
Traffic Engineering and Safety Systems Branch  
North Carolina Department of Transportation

**Principal Investigator**

\_\_\_\_\_  
Brad Robinson, EI

Traffic Safety Project Engineer

9/5/2006  
Date

# ***Spot Safety Project Evaluation Documentation***

## **Subject Location**

Evaluation of Spot Safety Project Number 09-01-209 – The Intersection of NC 152 and SR 1541/ SR 1419 (Stirewalt Rd) in Rowan County.

## **Project Information and Background from the Project File Folder**

The spot safety project improvement countermeasure chosen for the subject location was the widening of NC 152 to provide eastbound and westbound left-turn lanes. NC 152 was a two-lane facility at the subject location prior to the project. SR 1541/ SR 1419 (Stirewalt Rd) is a two-lane facility with no left-turn lanes at the subject location. All approaches to the intersection have speed limits of 55 mph. The subject location is a four-leg intersection, which is controlled by stop signs on SR 1541/SR 1419 (Stirewalt Rd).

The original statement of problem was that vehicles were slowing or stopping to turn left on a two-lane, high-speed road. The turn lanes were provided to alleviate rear end collisions caused by left turning traffic.

The initial crash analysis was completed from April 1, 1998 through April 1, 2001 with a total of 11 reported crashes. There were 10 rear-end crashes which were deemed correctable by the improvement. The final completion date for the improvement at the subject intersection was on November 29, 2001 with a total cost of \$110,000.00.

## **Naive Before and After Analysis**

After reviewing the spot safety project file folder along with all the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from October 1, 2001 through December 31, 2001. The before period consisted of reported crashes from November 1, 1997 through September 30, 2001 (3 years and 11 months) and the after period consisted of reported crashes from January 1, 2002 through November 30, 2005 (3 years and 11 months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes within 150 feet of the intersection. *Please see attached location map for further details.*

The following data table depicts the Naive Before and After Analysis for the treatment location. Please note that Rear End Crashes on NC 152 were the target crashes for the applied countermeasure.

<b><u>Treatment Information</u></b>			
	<b>Before</b>	<b>After</b>	<b>Percent Reduction (-) Percent Increase (+)</b>
Total crashes	12	5	-58.3
Total Severity Index	4.7	5.44	15.7
Target Crashes	10*	0	-100.0
Target Crashes Severity Index	4.7	N/A	N/A
Volume	7600	7900	3.9
<b><u>Injury Summary</u></b>			
Fatal injuries	0	0	N/A
Class A injuries	0	0	N/A
Class B injuries	5	0	-100.0
Class C Injuries	6	4	-33.3
Total Non-Fatal Injuries	11	4	-63.6
Total Injuries	11	4	-63.6

\* An Angle Crash was added to Target Crashes (See Results and Discussion Section)

The naive before and after analysis at the treatment location resulted in a 58 percent decrease in Total Crashes, a 100 percent decrease in Target Crashes, and a 4 percent increase in Average Daily Traffic (ADT). The before period ADT year was 1999 and the after period ADT year was 2003.

## Results and Discussion

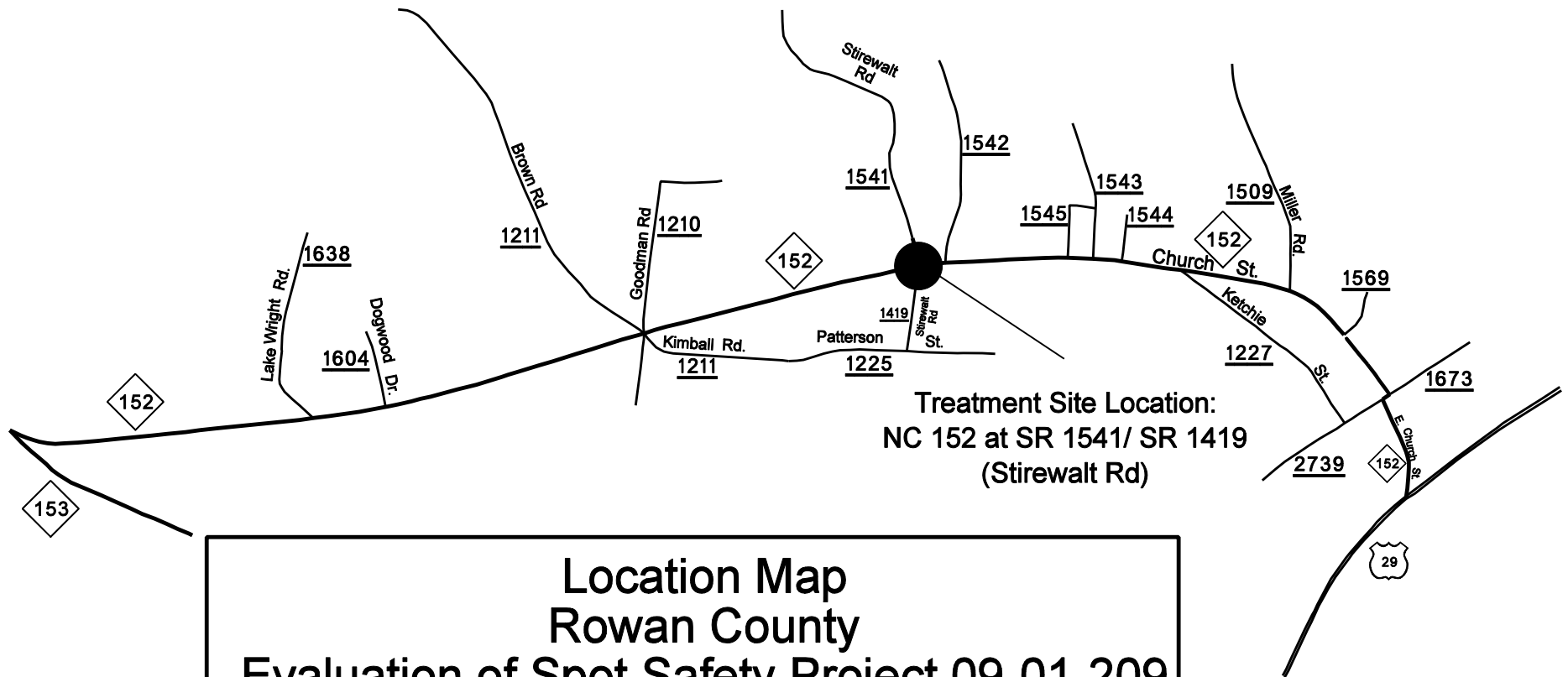
The naive before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 58 percent decrease in Total Crashes and a 100 percent decrease in Target Crashes. The summary results above demonstrate that the treatment location appears to have had a decrease in both Total Crashes and Target Crashes from the before to the after period.

The crash statistics show an increase in the severity index, which can be slightly misleading. Despite the increase in the severity index, all injury types (except those that were already zero) actually decreased from the before period to the after period.

The chosen countermeasure appears to have been very effective in correcting the problem of Rear End Crashes. In the before period there were nine Rear End Crashes and one Angle Crash that was added to the Target Crashes (*Before Period* Crash #12). The Angle Crash was added because it involved a driver trying to avoid a Rear End Crash and running into a stopped vehicle on SR 1419. In the after period there were no Rear End Crashes.

Please see the attached *Treatment Site Photos*. Photos are provided for all approaches to the treatment intersection.

As the Safety Evaluation Group completes additional spot safety reviews for this type of countermeasure, we will be able to provide objective and definite information regarding actual crash reduction factors for this type of intersection.



**Location Map  
Rowan County  
Evaluation of Spot Safety Project 09-01-209**

**Treatment Site Photos Taken July 27, 2006**



**Traveling West on NC 152**



**Traveling West on NC 152**



**Traveling East on NC 152**



**Traveling East on NC 152**



**Traveling North on SR 1419 (Stirewalt Rd)**



**Traveling North on SR 1419 (Stirewalt Rd)**





**Traveling South on SR 1541 (Stirewalt Rd)**



**Traveling South on SR 1541 (Stirewalt Rd)**



SR 1541  
(Stirewalt Rd)  
55 mph

NC 152  
55 mph



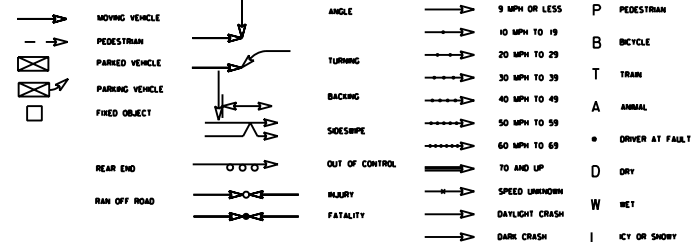
Left-Turning Vehicle initially went right.  
Through vehicle tried to go around on  
left side, but vehicle turned left into it.  
Either making a left turn or a U-turn

Eastbound vehicle couldn't slow  
in time to avoid left-turning vehicle.  
Veered to the right and hit stopped  
vehicle


Rowan County  
NC 152 at SR 1419/  
SR 1541 (Stirewalt Rd)  
in the Before Period  
From 11/1/97 to 9/30/01

SR 1419  
(Stirewalt Rd)  
55 mph

## LEGEND



NC 152  
55 mph

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
HIGHWAY SAFETY IMPROVEMENT PROGRAM		SAFETY INFORMATION MANAGEMENT AND SUPPORT	
		DIVISION: 30	AREA: ..
		STUDY PERIOD: 11/1/97 TO 9/30/2001	
		DISTANCE: ..... Y-LINE: 60 FT	
		ANALYSIS PREPARED BY: B. Bobbitt	
		DIAGRAM PREPARED BY: B. Bobbitt	
SAFETY EVALUATION		TRAFFIC SAFETY	
BEFORE TURN LANES		SCALE: NOT TO SCALE	
		DATE: Nov 2006	
		LOG NUMBER: 2006025	
N.C. DEPARTMENT of TRANSPORTATION			
DIVISION of HIGHWAYS			
TRAFFIC ENGINEERING AND SAFETY			
SYSTEMS BRANCH			

SR 1541  
(Stirewalt Rd)  
55 mph



Vehicle ran off roadway to  
avoid collision w/ left turning  
vehicle from northern leg

NC 152  
55 mph

Drivers of both vehicles stated  
the intersection was filled with  
smoke from tire friction, obscuring  
vision



④ D \*

① W \*

⑤ W \*

② W \*

③ D \*

NC 152  
55 mph



SR 1419  
(Stirewalt Rd)  
55 mph

Rowan County  
NC 152 at SR 1419/  
SR 1541 (Stirewalt Rd)  
in the After Period  
From 1/1/02 to 11/30/05

## LEGEND

	MOVING VEHICLE		ANGLE		9 MPH OR LESS		P PEDESTRIAN
	PEDESTRIAN		TURNING		10 MPH TO 19		B BICYCLE
	PAKED VEHICLE		BACKING		20 MPH TO 29		T TRAIN
	PARKING VEHICLE		SIDESWIPE		30 MPH TO 39		A ANIMAL
	FIXED OBJECT		OUT OF CONTROL		40 MPH TO 49		• DRIVER AT FAULT
	HEAD ON		HAILTY		50 MPH TO 59		D DRY
	REAR END		FATALITY		60 MPH TO 69		W WET
	RAN OFF ROAD		DARK CRASH		SPEED UNKNOWN		I ICY OR SNOW
			TO AND UP		DAYLIGHT CRASH		

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT		COLLISION DIAGRAM	
HIGHWAY SAFETY IMPROVEMENT PROGRAM		SAFETY INFORMATION MANAGEMENT AND SUPPORT	
		DIVISION: 9	AREA: ..
		STUDY PERIOD: 6/1/2001 TO 3/30/2005	
		DISTANCE: ..... Y-LINE: 150 FT	
		ANALYSIS PREPARED BY: B.RODOLFO	
		DIAGRAM PREPARED BY: B.RODOLFO	
DIAGRAM REVIEWED BY: .....			
SAFETY EVALUATION		TRAFFIC SAFETY	
AFTER TURN LANES		SCALE: NOT TO SCALE	
		DATE: MAR 01, 2006	
		LOG NUMBER: 20050225	
<b>N.C. DEPARTMENT of TRANSPORTATION</b> <b>DIVISION of HIGHWAYS</b> <b>TRAFFIC ENGINEERING AND SAFETY</b> <b>SYSTEMS BRANCH</b>			